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ABSTRACT

Sixteen college students were measured for "skin conductance responses" (SCR) while they viewed four films on either a movie or a television screen in a study of selected media differences between theatrical film and television viewing. The students watched a bland (nonaggressive) and an aggressive film on one medium, then viewed two similar films on the other medium, providing self-reports of their responses by completing "Mood Adjective Check lists." Although the researchers hypothesized that theatrical film viewers would show greater arousal for aggressive films and less arousal for bland films than television viewers, SCR data show greater arousal for film viewing only during scenes depicting violent death. Researchers find no substantial support for a general media effect of viewer arousal, but they note that different types of aggressive film content create different arousal levels and that uninteresting film content produces "sub-resting" SCR levels. (RL)

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AROUSAL EFFECTS OF AGGRESSIVE FILM CONTENT AS
A FUNCTION OF VIEWING MEDIUM

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AROUSAL EFFECTS OF AGGRESSIVE FILM CONTENT AS
A FUNCTION OF VIEWING MEDIUM

For practically the entire history of film, intuitive forces from within have told us that certain techniques create certain responses: fast cutting promotes excitement, low camera angles give character dominance, background music enhances mood, etc. Although we can be fairly confident in these assumptions, based on previous experience, the actual effects remain to be proven (or at least strongly supported by systematic research). It most likely would be no surprise to us to discover that certain choices of music indeed have certain effects on mood. Violins are as appropriate for romantic scenes as herald trumpets are to announce the arrival of a medieval war hero. But this is perhaps over-simplifying the issue. As any student of Kubrick (Dr. Strangelove, Clockwork Orange, Barry Lyndon) or Bergman (Through a Glass Darkly, Hour of the Wolf, The Silence, etc.) knows, the use of music can be far more subtle, with profound influence on dramatic contexts.

Other variables similar to music manipulation must be considered within a subtle framework. Control of psychological mood has been attempted through techniques of cinematography, make-up, costuming, set design, sound effects, etc. To this list of staple techniques may be added the modern ones: wide screen, multiple images, 3-D, mixed media, etc. It is apparent that choices facing the modern filmmaker are staggering. The task is no less difficult for the film theorist-scholar who must sort through this maze of techniques and formulate tentative theories that could influence paradigm construction.

The efforts in communication research of media effects have been hampered by the lack of systematic guidelines and substantial theory.¹ McGuire² has

pointed out this lack of organized theory related to media and channel variables. This has not inhibited isolated attempts at quantifying effects as a function of medium, with a considerable body of work existing in the area of political communication. Lack of concerted effort in theory building on the numerous aspects of media differences, however, provides little guidance for research in this direction. It becomes the task of the researcher, then, to carefully set and define operational parameters within the perspectives of existing or intuitive theory. The influence of media characteristics was asserted some time ago by Innis³ with his concept of technological determinism. This idea suggested that society as a whole is affected by different media forms, which could assert influence on thinking and behavior. Innis' thesis was adopted, expanded, and popularized by McLuhan, whose technological embellishments on the basic theme have prompted considerable discussion. Although controversial and sometimes self-contradictory, McLuhan's theories have encouraged many workers to examine various media structures and characteristics as communication variables. His well-known concept of medium as message is scientifically simplistic and perhaps even naive, but it does provide an interesting approach to media study. He contends that each medium carries with it a set of implied rules that govern syntax and interpretation. For example, television, being composed of totally electronic images made up of lines and dots, is thought to affect viewers differently than other visual media which use other structural components. The use of sensory words to describe various media ("cool," "hot") characterized McLuhan's highly subjective theories, which are therefore difficult to test empirically. It should be stressed at this point that it is not the purpose of this study to test any of McLuhan's theories, and his work is mentioned only because of its influence on research

in media variables. Theoretical bases from which to construct testable hypotheses of differential media effects are not generally to be found in the work of Innis and McLuhan, but their contributions have illuminated these effects and revealed the possibilities of substantial differences.

This background provides the foundation for this study, which examined selected differences between the visual media of film and television. The primary purpose was to experimentally determine the combined relative effects of image size and medium characteristics as measured by physiological response (Skin Conductance Response) and psychological self-reports of mood. The study was mainly concerned with audience response to film stimuli, and therefore films designed for theatrical release were used in both the film and television viewing situations. Films were chosen that contained aggressive, stress-producing content, to provide high stimulus levels in an effort to assess the manner in which audiences react as a function of image size and viewing environment.

The vast differences between cinematic and television media have often been pointed out with occasional suggestion as to their effects. The typical film viewing situation, composed of a darkened room, large bright image, and high quality sound, sharply contrasts with the usual television environment, which has exactly opposite characteristics. Intuitively, it could be assumed that the film viewing condition would entail more viewer involvement and emotional effect than seeing the same stressful film on television. It is this general assumption that forms the base for this study's hypotheses.

The significance in determining this relationship may have implications in several areas. Since the principal film content dealt with is aggression, should it be determined that its impact is significantly less when viewed through

the medium of television, insights in program planning could result. Perhaps the current concern for televised violence might be put in perspective, when compared to the effects of theatrical film violence. For example, relatively little attention has been directed to theatrical film violence, compared to violence on television. The self-selecting rating system for theatres provides audience guidance and has perhaps served to decrease the urgency to closely examine audience response. If it can be shown that theatrical film exhibition has significantly greater arousal ability than television, then more attention would be indicated than is currently being focused in this area.

Screen size is but one of many differences between the film and television media, and any significant difference found cannot be attributed to that variable alone. Therefore, in this study no inferences were made to theatrical settings solely due to screen size variation. The screen size concept may lead to useful information as a separate variable, although the numerous environmental differences between the two media would present difficulties in removing interaction effects. This would be worth the effort, however, since screen size reduction has become wide spread in recent years with the growth of shopping center "mini" theatres and the multiple theatre concept, small group rear screen devices, and personal one-to-one learning machines. It seems crucial to determine what this trend is producing, if any, in the way of affective changes between medium and viewer.

In both the film and television literature considerable attention has been given to the effects of aggressive content and, in the case of children's programs, many experimental studies have been conducted.^{4,5} These studies have concentrated mainly on the effects of viewed violence on subsequent behavior, and have dealt with a single medium, either film or television. Total concensus

is, of course, not reached on what these effects are, but it is generally agreed that violent content tends to promote aggressive behavior, as revealed in the majority of studies with children and televised violence. It should be noted that none of the celebrated studies of the relationship between children and television violence employ physiological dependent measures. Application of these measuring techniques has not received wide attention in film studies, the work of Lazarus and his associates being the primary exception.⁶

If the medium of television can induce aggressiveness, it seems logical to assume that the identical film content when projected on a large, bright screen, in an atmosphere conducive to attention, and with high quality sound would produce similar results. In fact, since the viewing situation would be considerably more intense, it seems reasonable to assume that overall affect would be greater than in a typical television viewing environment. This reasoning forms the basis for the study's principal hypothesis:

- H₁: A film containing aggressive content produces greater autonomic arousal in viewers who see it in a film projection environment than through the medium of television.

Dependent physiological measures were taken of the Skin Conductance Response (SCR), which were used to both determine overall differences and point-to-point comparisons of specific events. Sometimes referred to as the Galvanic Skin Response (GSR), it is actually a measurement of variations in skin resistance to a stimulus. These resistance values are almost always converted to reciprocal values of conductance, and it is this change in conductance that is actually analyzed as the dependent variable. Since conductance more adequately refers to the response, the term "skin conductance response" seems more appropriate than "galvanic skin response" and the former term has come into general use by the scientific community.

In the study of film, physiological techniques have many advantages. Certain procedures, especially the SCR, are extremely sensitive and, measuring autonomic responses of the central nervous system, provide uninhibited data (not consciously controlled by the subject). The SCR is particularly valuable, due to its almost instantaneous response to emotional stimuli. Since emotional reaction is of primary concern in film studies, this measure would yield uniquely valuable data. In addition, monitoring during stimulation produces a set of continuous data, allowing for very complete analysis. In the case of film, this total, continuous picture can be contrasted with point-to-point comparisons of selected critical scenes to aid in the determination of the impact of key arousing scenes in relation to overall affect. Another advantage inherent with physiological methods is the precise manipulation of independent variables. Experimental settings allow the researcher to construct designs that yield data principally influenced by independent variables, if measuring techniques are carefully applied.

The great sensitivity of the SCR⁷ and its monotonic relationship to stimuli⁸ have given it popular appeal as an arousal indicator. It has also received considerable criticism due to questions concerning interpretation and spurious response caused by extraneous variables that may be either internally or externally created. Further, separate autonomic systems behave differently to various stimuli and often produce low correlations, although many leading scholars do not regard this as crucial to construct validity.⁹

The multidimensionality of autonomic systems has been the subject of much discussion, which was summarized well by Taylor & Epstein.¹⁰ They suggested that autonomic measures are actually measuring different systems and previously

reported low correlations¹¹ can be explained on this basis. Different systems are regarded as having distinct response characteristics to threat or stress, and often heart rate data reveal an inverse relationship to that reported by skin conductance. Used together, a cancelling effect would occur which could result in non-significant conclusions. Separately, valuable organismic response patterns could be observed, but only on one particular dimension. The validity of each measure taken separately could be high and perhaps wisely choosing one, based on the conditions of the experiment, would yield valid results. This choice would be dictated by the nature of the stimuli employed and the type of response to be studied. For example, heart rate appears to respond to cognitive processing while the SCR is more closely associated with affective response. The SCR, therefore, seems preferable in most situations involving film stimuli.

The assumption regarding the film medium's greater viewer involvement prompts the formulation of a second hypothesis:

- H₂: A film containing aggressive content produces a greater change of psychological mood between pre and post viewing in viewers who see it in a film projection environment than through the medium of television.

The Nowlis Mood Adjective Check List was employed to test this hypothesis.¹² The Nowlis check list, consisting of 140 adjectives, is the result of extensive attitude change research by Nowlis and his associates and has been used in several previous film studies where it has proven to be a valuable indicator of mood change.^{13,14,15}

Immediately following each film showing, the subjects were given the Nowlis MACL questionnaire. The objective was to determine the subject's own assessment of his psychological mood before and after exposure to an aggressive film, and to test for differences, which could presumably be attributed to the effect of stressful content in the aggressive film. The respondent indicated his

degree of feeling on each adjective from four possible responses: 1) definitely describes your mood, 2) only slightly describes your mood, 3) cannot decide if it does or not, and 4) definitely does not describe your mood.

From the 140 individual words, Nowlis has determined that they group into 12 clusters, or factors, that comprise the principal mood dimensions capable of being extracted: Aggression, Anxiety, Surgency (Pleasantness), Elation, Concentration, Fatigue, Social Affection, Sadness, Skepticism, Egotism, Vigor (Activation), and Nonchalance. Although all of these factors have been used in several film studies, it is common practice to use fewer.^{16,17} Since this study is mainly concerned with mood change relating to aggressive (unpleasant) film content, six factors were selected that could be expected to change: Aggression, Pleasantness, Activation, Social Affection, Anxiety, and Depression (Sadness). Researchers who have factor analyzed the list in various studies have found the recurrence of certain words on each factor, thus suggesting rather high reliability of factor independence. The individual words comprising the six factors chosen for this study are as follows: Aggression is represented by the words annoyed, fed-up, rebellious, angry, defiant, and grouchy; Pleasantness is composed of pleased, lighthearted, carefree, playful, talkative, witty, lively, and refreshed; Activation by energetic, vigorous, and active; Social Affection by sociable, warmhearted, kindly, genial, forgiving, and affectionate; Anxiety by jittery, shocked, fearful, clutched-up, and startled; and Depression by regretful, sorry, downhearted, insecure, sad, and frustrated. These words were interspersed randomly throughout the total list of 140 words, thereby concealing the actual mood variables being examined.

The third hypothesis was based on an interesting finding in a study by Kaiser and Roessler,¹⁸ who found that the number and amplitude of SCRs were

greater in a subject's resting state than when viewing a film of bland content. The implication here is that a bland film has the ability to lull the viewer into a state of arousal below that of a resting condition. Perhaps several explanations could account for this, such as boredom, inducement into drowsiness or trance-like states. Since each group of subjects in this study also viewed a bland film as part of the design, it was hypothesized that:

- H₃: Mean skin conductance is lower among viewers who see a bland film in a film projection environment than through the medium of television.

The logic behind this hypothesis is the same as the other two, based on the assumed characteristics of the film medium having greater emotional impact than the identical televised image. Just as it was hypothesized that a projected image will generate more intense anxiety with stressful content, it is likely to have the reverse effect with dull, bland stimuli. If the assumption is valid that television has less total manifest affect, it follows that it also would have a less relaxing effect on viewers, exposed to bland content. In relating this idea to findings of the Kaiser and Roessler study, it was expected that the mean skin conductance would fall below resting base levels for film viewers, and would be approximately the same in television viewers.

The fourth hypothesis also involved the bland film and was actually an explicit statement of relationships implied by the first and third hypothesis:

- H₄: The differences in autonomic arousal between bland and aggressive films is greater when viewed in a film projection environment than through the medium of television.

In the study's design, two separate aggressive films were shown, one of which primarily consisted of physical violence while the other contained scenes of interpersonal conflict and aggression of a more intellectual nature (there was one act of physical violence, however). This latter film was considered to have more effect on cognitive processes in viewers, having a fairly well-developed main character who overtly pushes his way to advancement in a corporate

structure. It was assumed that the viewer would follow this brief plot, perhaps identifying with situations and characters. Emotional reaction might be considered to result from more intellectual involvement with dramatic content than would be the case with the less complex film containing scenes of violence. The violent film, having less development of characters and plot, was considered to affect mainly emotional reactions of viewers. These assumptions were based on previous suggestions concerning the nature of the SCR versus other autonomic channels, such as heart rate. This differentiation has been found by several researchers who noted low correlations among various autonomic indicators.^{19,20,21} The SCR has been quite consistent, however, in responding to emotionally arousing stimuli and has therefore been particularly valuable in film studies. Because of this quality of single dimensionality, it was reasoned that the two separate aggressive films should produce different SCR patterns. Since these responses closely follow the viewer's emotional reaction to film, and the two aggressive films used in the study contained scenes of differing emotional content, no formal hypothesis was suggested to test this difference. Rather, it was only expected that a difference would be found, but insufficient theoretical base prevented a prediction of either magnitude or direction.

PROCEDURE

The individuals chosen for the experiment were recruited from three sections of basic university communication courses for non-majors, who represented many disciplines and interests and a good cross-section student sample. And most importantly, they regarded themselves as average film and television viewers without extraordinary interest in visual media. The sample consisted of eight females and eight males, with ages ranging from 19 to 22. Similarity of social backgrounds and environment, as well as age, further tended to create homogeneity.

The 16 subjects were equally divided as to sex and were randomly assigned to four groups, consisting of two males and two females each. Each group viewed two pairs of films, one pair on a television receiver, and the other pair projected on a screen. Each pair consisted of first the bland film, followed by the aggressive film. One of the aggressive films contained primarily interpersonal conflict surrounding callous and selfish manipulation by a junior corporate executive for self-promotion in a large London firm. This film, as in the case with the others, ran approximately 15 minutes and was an edited condensation from the feature film, The Reckoning. The companion bland film was Vocations in Agriculture, which depicted the various occupational fields a young person might choose as a career in agriculture. For the purpose of reference, these films were assigned the designation of B_1 (bland) and A_1 (aggressive). In like manner, the other pair of films was designated B_2 and A_2 . The aggressive film in the second pair was composed of compiled scenes of violence from the feature, Barabbas. The accompanying bland film was Animal Navigation, depicting the manner in which birds, ants, and bees migrate and find food.

In The Reckoning excerpt (A_1), there was character development, plot, and action consisting mainly of tense, aggressive dialogue. In contrast to this more intellectual, verbal approach to aggression, the Barabbas excerpt (A_2) had little character identification, no details of story, and little dialogue. Being composed of scenes showing physical violence, it represented the most typical form of aggression found on the screen.

The choice of the bland films was mostly arbitrary, being determined in part by the running time of the aggressive films. Since these both ran about 15 minutes, it was desired to choose a similar length for the bland films, which was accomplished in the choices made. The actual content was in consequential, although it was carefully determined that neither film contained arousing scenes of an aggressive nature.

Table 1 shows the overall structure of the study's design. It should be noted that all 16 subjects were involved in session 1, and again in session 2 but with a reversal of film and media order. For example, in session 1 group 1 saw B_1 and A_1 in a projection situation, but in session 2 the same group saw B_2 and A_2 on television. This particular ordering through all four groups allowed for the accounting of order effects in the analysis. Also, by using all subjects in a repeated measures design, the subjects could serve as their own controls, thus eliminating many contaminating variables.

(Insert Table 1 here)

All sessions, film and television, were held in the evening between the hours of 7 and 11 p.m. Also, session 2 was matched to session 1 by time and day. For example, if subjects 1 and 2 saw films B_1 and A_1 projected on Tuesday evening at 7 p.m., they would see films B_2 and A_2 on television the following Tuesday at the same time. This matching of days and times of the two sessions was done in an effort to further minimize error variables. It was assumed, although certainly not strictly true, that a person's daily routine, psychological responses, and biological rhythms would be similar at corresponding times of each week and therefore would promote consistency of physiological and psychological responses to film stimuli. There is no way to absolutely control for these variables, but it was reasoned that they could be minimized as much as possible by matching the sessions.

Several other variables were taken into consideration that influence the SCR. It has been shown that females tend to have lower conductance than males, which prompted the equalization of the sample by sex.²² This was also done to account for social interaction such as sexual attraction, inhibition, etc. that might exist in a mixed audience. Since age affects the SCR, subjects were chosen within the age group of 19 to 22 which was easily obtained from the

undergraduate sample. Homogeneity was assumed in the sample on other variables that might affect skin conductance such as health, intelligence, and social status.

Subjects must be in a relatively stable physiological state for skin conductance variation to stay within manageable limits. In this study, approximately 15 minutes was required for subjects to reach a stabilized condition of rest and hydration. During this period they sat quietly in the same room lighting conditions that prevailed during the film showing, i.e. for the projection sessions the room was dark, while one lamp was on during the television rest period. Skin conductance was monitored throughout the rest period, and when stabilized, recording was begun and continued for four minutes. The means of these basal data were used as covariates for stimuli data to adjust for correlated relationships. This removes the effect of resting levels on the data obtained during the stimulus, leaving difference values which were indicators of stimulus effects only. This difference score covariance adjustment follows the recommendations of Heath and Oken, who suggested it as a solution for the Law of Initial Values (LIV) as related to resting data.²³ Briefly, the LIV states that the magnitude of autonomic response to a stimulus is related to the pre-stimulus conductance level.²⁴ In other words, if the pre-stimulus level (resting) is high, there is a tendency for the magnitude of responses to stimuli to be small, and vice versa. In fact, it is possible for initial levels to be sufficiently high to inhibit responses altogether.

Two sets of resting data were recorded during each session of the experiment, one prior to the bland film and one prior to the aggressive film. This allowed for variation in resting levels after the bland film was seen, and after administration of the Nowlis MACL which immediately followed the film. The first resting data, then, were used as covariates for the bland film, and the second set was used for the aggressive film.

Sampling of skin conductance during the films was done in 30-second intervals, thus yielding about 30 scores. An estimated mean of the interval, determined by visual inspection of the chart trace, was recorded as the score for that interval. By using this method, instead of a point-by-point method, greater accuracy is obtained in reducing the effects of sudden or short-term extremes in recorded values. In a point-by-point data set, much information is lost which occurs between the points observed. The mean interval technique takes into account the continuous nature of data recorded during the interval and supplies a smoothed value which best describes response within the interval.

In addition to the 30-second interval sampling, certain selected scenes in the aggressive films were analyzed by the point-by-point method. The first hypothesis could therefore be tested both by overall mean differences and specific point comparison of key scenes. In order to test between groups at the specific points in the aggressive films, the SCR at that exact moment was used as the unit of measurement. Since the nature of film stimuli was considered to be very strong in arousing capability compared to many other forms, an SCR was considered to occur only if there was a drop of at least 1,000 ohms resistance within five seconds after the selected event in the film.

A Narco Physiograph recorder was used, employing soft lead finger electrodes. These were placed on the two major volar surfaces of the subject's non-preferred hand using velcro straps. Being attached to the same finger eliminated relative movement responses which often occur with other methods. Seating was provided to reduce other bodily movement. The Physiograph, as the case with most SCR devices, measures skin resistance, in ohms, of a subject on a continuous basis, plotting the output on slowly moving graph paper. In order to use these data in the analysis, they must be converted to conductance units, expressed in micromhos, the reciprocal of resistance. After this transformation was made, the log of the micromhos value was determined and it is

this value that was used in the actual analysis. The rationale for the use of a log value (others may also be used such as square roots and z scores) was based on the suggestions of Darrow.²⁵

Two approaches were used to analyze the physiological data. First, it was desired to test for overall mean differences in arousal levels among and between the various groups. Because of this complexity, a mixed analysis of variance (ANOVA) design for repeated measures was employed, following the Lindquist Type IV model.²⁶ This design provides for order effects, specific pinpointing of significant variance, and three-way interaction along with the standard main effects.

The second approach to the skin conductance data pertained specifically to the magnitudes of responses during selected dramatic events in the aggressive films. Since the points of measurement were specifically chosen during intense and stressful moments in the films, the baseline correlation had to be considered at that particular moment. The means of the resting data would most likely be too low to accurately account for the actual homeostatic forces operating during periods of arousal. Instead, a base level was recorded as the value of conductance immediately prior to the dramatic event, thus reflecting the general stimulus level created by the film. This level was almost always much higher than resting levels and represented a more accurate covariance value for specific points of strong stimuli. This point-by-point correction for LIV at points of inflection has been employed by several others, with the resulting covaried data being used in t-test comparisons between groups.^{27, 28} This method was adopted for the event data, using t-tests for uncorrelated means.

The Nowlis MACL data were analyzed by the same Lindquist ANOVA design used for overall comparisons of the physiological data. The interest was in determining the degree of change created by the aggressive films on six variables of mood. In discussing the MACL, Nowlis described several factor analytic studies

that revealed agreement on at least 12 factors from the 140-word list.²⁹ In order to determine the extent of agreement of loadings on the six factors used in this study, two types of factor analysis were conducted. First, taking all responses from the MACL after the aggressive films (post scores), a principal components solution (orthogonal) was performed. Second, all scores were pooled for a second analysis using oblique rotation. The two separate analyses were done to discover the degree of association of the words within the six variables under two conditions of administration. It was reasoned that post scores only should reveal a rather strong patterned relationship, being influenced by a controlled stimulus. For this reason, orthogonal rotation was employed to ascertain this strength. An oblique solution was chosen for the pooled scores under the assumption that weaker associations might exist in the combination of pre and post responses, and a controlled correlated approach would more accurately represent true relationships.

The six Nowlis factors chosen for study, which consisted of a total of 36 words in various groupings were analyzed in the same manner as the SCR data, a method which was again useful since mean differences between variables were revealed in each component group of the design in addition to overall effects. For example, it was possible to compare mood changes in group 1 created by film A₂ viewed on television to the same film projected to group 2. In like manner, many combinations of groups, films, and treatments could be compared to determine very specific interrelationships and sources of most influence.

RESULTS AND DISCUSSION

Overall SCR Means

Table 2 is a summary of the analysis of overall SCR means, from log conductance units. Examination of the table reveals four significant F values,

(Insert Table 2 here)

the highest occurring on the interaction of session by film version (AD, $p < .005$). The cell means involved in this relationship show a very much lower physiological arousal level for version one ($B_1 A_1$) than version two ($B_2 A_2$). As seen in Table 3, version 1 means are actually below resting level, since they have negative values. This would not be surprising only if the data from the bland film were

(Insert Table 3 here)

involved, but since it is a combination of both bland and aggressive data it suggests that aggressive film A_1 might have a very weak ability to arouse. In order to precisely determine this, it was necessary to separate the B_1 and A_1 means to see if B_1 was offsetting the arousing effect of A_1 with extreme negative values. Table 4 presents data from each cell, allowing examination of SCR response to individual films.

(Insert Table 4 here)

Table 5 combines data from both sessions and shows the overall response to film versions as a function of viewing medium.

(Insert Table 5 here)

Although B_1 did have a large negative effect on arousal ($\bar{X} = -5.41$), this did not fully account for the total sub-resting effect. The very surprising finding is that A_1 itself produced a negative arousal level ($\bar{X} = -1.29$), a result totally unexpected from a film stimulus containing stressful content. Obviously, the combined $B_1 A_1$ grand mean of -6.70 compared with the $B_2 A_2$ grand mean of 22.26 is responsible for the major variance between film versions. However, since A_1 falls below resting levels it becomes important to examine the levels produced by A_2 (as well as B_2) to see how much of the variance might be attributed to differences between types of aggressive content.

The large difference between A_1 and A_2 is readily seen in the film group, while the television group has slightly more separation between B_1 and B_2 than between A_1 and A_2 . The major contributor to the overall variance, then, is the $A_1 - A_2$ difference among film viewers. The total effect, of course, is seen in the consistent spread between $B_1 B_2$ and $A_1 A_2$. Although not specifically hypothesized, differences between A_1 and A_2 were suggested based on the diverse nature of their aggressive content. Table 5 clearly shows support for such a thesis as well as pointing to a similar relationship between B_1 and B_2 .

Although the different types of aggression contained in A_1 and A_2 have been discussed, and was predicted to create different arousal levels, the types of bland content of B_1 and B_2 was not regarded to substantially affect the SCR. Apparently the nature of bland content has a great deal to do with arousal levels, independent of scenes of stress or conflict.

Neither B_1 nor B_2 contained scenes that by any measure could be thought aggressive or stressful. Both films were constructed to be strictly informative, with typical dry commentary by a narrator accompanied by an undistinguished music score. The principal difference was content. Vocations in Agriculture (B_1) contained material most likely boring to an average viewer. In the case of subjects used in this experiment, who were all undergraduate college students, agricultural topics could easily have little appeal in either interest or emotional involvement. Animal Navigation (B_2) might be regarded as having more intrinsic appeal due to its inherently more interesting subject matter. The film consisted of numerous extreme close shots of bees and ants under experimental manipulation and details of their navigational instincts. It is quite likely that this film was more interesting to watch than the agriculture film, although no more emotionally arousing. If this is the case, we can assume that the construct of interest is responsible for the higher arousal level produced by B_2 . This suggests that extreme care needs to be exercised in the choice of bland film stimuli, from both emotional and in-

formational standpoints. It is apparent from B_2 and A_1 data that the aggressive film, which contained genuine conflict and violence, had far less physiological impact on viewers than the animal film which was totally without stressful content. One explanation for the weak SCR reaction to A_1 might be related to the dramatic nature of this film and the inability to compress within 15 minutes the necessary subtleties of plot and character development needed for significant emotional involvement. The film begins without introduction and the immediate presentation of dialogue scenes, although harsh and aggressive in nature, does not allow the viewer to relate to story or character. As the film continues, enough plot and protagonist character development occurs for moderate viewer involvement, perhaps approaching the level by the end of the film that might be experienced with the original full-length version. However, even this level most likely would not approach the degree of arousal produced by A_2 . It seems, therefore, that an undeveloped aggressive film consisting primarily of interpersonal conflict, harsh dialogue, hostile gestures, and little compassion does not have the ability to create physiological arousal, as measured by the SCR, to the degree of either an interesting bland film or a purely violent aggressive film.

The effect of differing aggressive content is apparent in the A_1 and A_2 means, which are extremely different in the film group but less so among television viewers. A_2 is constructed similarly to A_1 , being a 15-minute excerpt from a feature film, but is totally unlike A_1 in both structure and type of aggression. Each scene is composed of violent physical conflict consisting of stabbing and maiming in the setting of a Roman fighting arena. These scenes obviously contrast with those in A_1 , with their modern setting, story, and heavy dialogue. Since little information is given concerning story and characters, it can be assumed that the violent content is the primary contributor to the vast SCR response difference from A_1 . This finding points out the possible validity of the wide-spread concern over film and televised violence and their arousing

effects. It appears, based on comparisons of A_1 and A_2 , that physical violence promotes intensely higher arousal levels than other types of aggression. It is perhaps no coincidence that previous psychological stress studies using film have employed as the stressor a film containing physical violence, e.g. Subincision (mutilation) and It Didn't Have to Happen (mutilation and death).

Although no significant differences are reported for media effect, which is the basis for three hypotheses, a rather definite trend concerning media can be seen in Table 5. For example, for film viewers the arousal level for both bland films and A_1 is lower than that of the television group. In contrast, the level of A_2 is higher in the film group than the television group. This tends to support the idea that the film medium produces exaggerated arousal effects as related to content, i.e. for a bland film a very low level of arousal is produced and for an emotionally stimulating film high arousal levels are produced. This must remain as conjecture at this point, since statistical significance was not achieved. It seems important, however, to note the consistent pattern between stimulus and arousal level compared across media, since it may suggest a relationship that in other contexts or settings could lead to significant differences.

There is some support for a media effect found in the BCD interaction term ($p < .10$). Examination of the appropriate means reveals the interaction occurring within the television group, which again relates mainly to differences in the film versions. As shown in Table 6, television viewers were much less aroused by the B_1A_1 film combination than by B_2A_2 . Other combinations from the BCD

(Insert Table 6 here)

triple interaction were examined and found to be unrelated. It is assumed, therefore, that the majority of variance can be attributed to the television group's responses to the different film pairs. Although the 10% confidence level cannot be regarded as strong support for this interaction, it can be accepted as tentative

since the F value of 4.43 closely approaches the 5% level and it supplies the only evidence of a media effect in the SCR data.

It is interesting that support for the version main effect is found in the television group and not in the film group, which further suggests a possible media effect. As previously noted, the difference between the $B_2 - A_2$ means in the film group is very much greater than between the $B_1 - A_1$ means. This prevents the occurrence of an interaction effect involving the version variable.

The B main effect of emotional content (bland vs. aggressive) produced the other high significance value ($p < .01$). This reports the overall difference between reactions to the bland films compared to the aggressive films and was not specifically hypothesized since there was tacit assumption that this difference would naturally occur, based on findings in numerous studies using bland and stress film stimuli. There are no instances in these studies where significant differences do not occur between the bland and stress films.

In conjunction with certain previous findings that noted bland levels to fall below resting levels, H_3 was formulated to test this as a function of the viewing medium. Although significance was not obtained on the media variable, the phenomenon of sub-resting arousal to bland stimuli occurred in all cases except B_2 among television viewers. It is apparently not uncommon for bland (boring?) stimuli to create and sustain negative states of arousal, in comparison to basal levels. It was consistently observed that after the initial response to the film's start, skin conductance would gradually decrease, reach base level, then fall to negative values for the duration of the film. The few exceptions to this (B_2 in the television group) were responsible for the only positive values associated with the bland films. These values were still not high enough to raise the mean bland response above resting levels.

Point-By-Point SCR Analysis

The other method of testing H_1 with SCR measures compared specific dramatic events in the aggressive films across film and television groups. These events were selected as representing the type of action most likely to stimulate arousal. In A_1 six events were chosen: 1) a close shot of the protagonist (Nicol Williamson) pointing his finger into the camera, which occupies a subjective point of view of the person receiving a tongue lashing, 2) a zoom shot of Williamson as he receives a telephone message concerning the death of his father, 3) a solemn burial scene with somber music, 4) a bar scene showing Williamson's frustration and increasing urge to do violence, 5) at a cocktail party, Williamson, upon being accused of being an Irishman, knocks his accuser down to the floor, which is shown in slow motion, and 6) a fast-paced speeding car sequence which contains several subjective shots from the perspective of the car's hood looking down the road. In each of these six events a specific point was chosen for marking, which was accomplished manually by the Physiograph's external event channel. For example, events 1, 2, and 5 are obvious, but the other three needed definite selection. Event 3 was recorded as dirt was pitched on the coffin, event 4 was recorded when Williamson slammed his fist into his hand, at which time there was a momentary flash cut back to the funeral scene, and event 6 was recorded on the first point-of-view shot. This standardization of events allowed exact replication of marking for each of the eight times the film ran.

The magnitude of SCRs within each event sequence was taken as the largest value occurring within 15 seconds following the marked event. The t-test for independent means was employed for event comparisons in the aggressive films.

The A_1 analysis compared groups 1 and 4 to groups 2 and 3 and revealed significance only on event 6 ($t = 2.21$, $p < .025$). The nature of this sequence, involving fast cutting, loud sound effects, and the very dynamic subjective shots apparently constitute a more arousing combination for film viewers than

television viewers. This seems reasonable, when the image size factor is considered. The fast-moving low angle subjective camera shot when viewed on a large screen with high quality sound effects would understandably create more tenseness and excitement than when viewed on a smaller television set. But this is the only action in A_1 that created different arousal levels between media groups and is certainly not sufficient to support H_1 .

It is surprising that event 5, which is the only physically violent act in the entire film, did not produce a higher arousal in the film group. This would be consistent with the general response noted between A_1 and A_2 , with violence being the major variable. The violent act of event 5 occurs almost without warning, however, which may account for weak responses. There is practically no conflict in the scene until the explosive moment when temper is lost and a blow is delivered in a split second, after which the scene quickly changes to an office setting. This lack of build-up and establishment of a violent atmosphere could be responsible for similar reaction levels found throughout the film.

The more arousing violent content of A_2 provided somewhat stronger evidence of media differences. Three out of eight events reached significance, which overall still does not provide conclusive support for a general media effect. These three significant events may provide further insight into the types of violent scenes that tend to be more arousing in a projection situation, and perhaps help explain why the media main effect failed to reach significance in this study.

The eight events selected from A_2 were somewhat similar in that physical violence of some sort was shown. These events were easily chosen due to the discrete nature of violent acts and the occurrence of certain ones in the film that tend to stand out. These are 1) a close shot of a warrior's hand being stepped on as he hangs from a wall above a lion's den, 2) a medium shot of the protagonist (Anthony Quinn) being thrown to the ground by a net, 3) a close shot

of a warrior in an exercise session being hit in the face by a mechanical revolving club, 4) a long shot of a Roman arena full of gladiators engaged in deadly combat, 5) a medium shot of a defeated man being knifed through the neck, 6) a close shot of a man being speared while tied to a stake, 7) a close shot of a net fouling the wheel of a horse-drawn chariot, and 8) a medium shot of the antagonist (Jack Palance) being knifed by Quinn.

Event 5 reached significance ($t = 1.81$, $p < .05$), event 6 approached significance ($t = 1.35$, $p < .10$), and event 8 produced the greatest media difference ($t = 3.11$, $p < .005$). Out of all eight events, these are the only three that actually showed a person being killed. Events 5 and 8, which produced the greatest differences were the same type of action but involving two different people, i.e. both are knifed through the neck while lying helplessly on their backs. The others contained violent activity but did not specifically show a man's death. Event 6 may only tentatively be accepted as being significantly different, since the 10% level contains a good possibility of chance occurrence. However, since this event was almost identical to the other two and all three sharply contrasted with the other five, it seems reasonable to assume that similar forces were at work in each case and event 6 can be accepted as revealing different media reactions.

It seems rather clear that only overt emotional scenes produce higher arousal levels in film viewers. As revealed in A_1 and A_2 , it took scenes of such stimulating content as a high speed subjectively-viewed auto ride and stabbing deaths to produce arousal differences as a function of viewing media. It should be noted that the death scenes were graphic portrayals of violent acts, containing physical mutilation. Arousal responses could be a result of this combined stimuli, not only involving the aspect of death itself. This finding may indicate that televised violence may not have the impact or arousal potential that has been attributed to it. Rather, the stronger reactions were

to be found among those who viewed film violence projected on a large screen. It may be more important to devote more attention to the effects of theatrical film violence involving graphic death scenes than to the more popular pursuit of televised violence.

Psychological Mood Data

Data acquired from the two administrations of the Nowlis MACL were factor analyzed to determine the mood variable structure and the amount of agreement with results of previous factor analytic studies reported by Nowlis. Two separate analyses were performed, as reported in Table 7.

(Insert Table 7 here)

There is considerable difference in the range of factor loadings produced by the two rotational methods, but general agreement is evident upon close examinations of the factor matrix. It was concluded that sufficient correspondence existed between the analyses on all six variables to assume parsimonious strength of dimensional clustering. In this sense, the relationship was demonstrated two ways, one by orthogonal rotation that imposed strict rules of correlation, and one using oblique rotation, which allowed for a more liberal interpretation and some intercorrelation. This latter approach naturally produced higher loading values which may reflect a more realistic situation, since it is not likely that discrete relationships exist among psychological constructs. Agreement between these two factorial methods promoted confidence in the factor structures.

There was a very definite word grouping along the dimensions found by Nowlis. They did not in all cases fit exactly as listed in the variable column of Table 7, but there was very close correspondence of similar dimensions. For example, the words constituting the variables of Aggression and Depression were mixed into a single factor, or shared by two factors. These two constructs

could be regarded as belonging to a general negative or unpleasant framework and therefore are closely related. Nowlis has observed this phenomenon and has indicated that it was not unusual for words to load on more than one factor. Similar results were observed with the variables Social Affection and Pleasantness. In the combined analysis, all of the Social Affection words loaded on factor 2, which also contained loadings on four words from the Pleasantness variable. The post analysis revealed a similar situation with these variables, but split between factors 1 and 6. The important point is that these two variables were always together, within what might be regarded as an overall pleasant framework. Activation and Anxiety words had strong tendencies to load on only one factor, thus indicating independence and a high affinity for the psychological dimension they occupied. It was concluded that the integrity of the Nowlis mood variables was sufficiently established as evidenced by factor loadings in the two analyses.

Lindquist's Type IV model was again employed in the analysis of the MACL data, which revealed insufficient support for H_2 . Significant media difference was noted only on the Activation variable ($p < .025$), and provides the only support from the entire MACL data for H_2 . Several significant differences were found scattered throughout the data which primarily involved main effects and interactions in various combinations on the film version variable. The film versions apparently had large differential effects on subjects' mood assessments in MACL variables, being reflected significantly in Aggression, Pleasantness, and Social Affection. Significant emotion main effect also showed up in three variables: Activation, Anxiety, and Social Affection. These results reflected those found in the SCR analysis. Although no formal correlational method was employed to determine correspondence between the SCR and MACL measures, subjectively there appears to be substantial agreement at many points, which has not often been observed in previous studies utilizing autonomic and self-report indicators.

Conclusions

Although the study's hypotheses went largely unsupported, several significant outcomes in other areas were discovered which are of particular interest. A difference in response was expected between the two aggressive film versions, but was not formally hypothesized since a directional prediction would be without strong foundation. Significance was discovered on this difference, with the more physically violent film creating larger responses on the SCR and three of the six MACL variables (Aggression, Pleasantness, and Social Affection).

The nature of the relationship between aggressive film content and media was discovered in the point-by-point SCR analysis performed at specific moments in each aggressive film and compared across television and film groups. Strong evidence was produced that indicated a media difference only with violent scenes that portrayed a person being killed. Two basic assumptions are indicated: 1) violent aggression arouse viewers more than other types of film content, and 2) scenes depicting murder arouse film viewers more than television viewers. The second assumption is based only on the event comparisons, and is not corroborated by the overall analysis between the two aggressive films involving means. However, since among the eight events chosen from the violent film the three that contained acts of killing reached significance, substantial confidence is generated for the assumption. Before this can be unequivocally accepted, an examination of the two dependent measures must be made to ascertain agreement, and therefore, reliability.

Implication of both assumptions seems clear. The television industry should indeed devote more attention to the issue of violence in general, since we have found that any kind of violence produced greater arousal than either non-stress or non-violent stress content. This effect is independent of viewing medium, and should be of concern for both television producers and theatrical exhibitors. Theatrical film exhibition perhaps does not present the vast sociological impact as the mass medium of television and the concern for violent

content, which is somewhat audience-regulated through the rating system, is not as critical. It should be of interest, however, that extremely high SCR levels are produced by death scenes, which have significantly greater values on the big screen than on television. The reverse interpretation, that death scenes on television may have no more arousal than other violent acts, presents some difficulties. If this is true, then why? One possible explanation, and a popular one among many psychologists, is to assume a violence-conditioning syndrome, in which viewers have become immune to televised violence in general and no one violent act would produce more arousal than any other. Another explanation, which is based on the theory used for this study, is that the medium itself is responsible for the difference, and television loses much of its arousal impact beyond a certain point.

Different responses to the two aggressive films were expected and were clearly observed, but the variation between the two bland film versions was a surprise. More surprising yet was the discovery of greater SCR arousal levels from a bland film (B_2) than an aggressive film (A_1). The concept of content interest was regarded to be the main factor responsible for this difference. Viewers were more aroused by animal navigation than by the aggressive manner displayed by a London executive. What was considered bland produced greater SCRs than what had been regarded stressful. It seems clear that subjective judgments concerning stimulation characteristics of individual films is incapable of accuracy, and more scientific measures need to be developed and applied.

If the film group had been able to view the films in a standard size theatre as part of a large audience, response levels and patterns may have been considerably different. We therefore conclude that the viewing environment variable as related to the film group does not adequately provide a situation that could produce data analagous to theatrical film viewing. Instead, the

situation more closely resembled typical 16mm film showings which are characterized by smaller screens, an almost square image, and environments designed for other purposes. It is appropriate, then, to draw inferences that only pertain to such film viewing as would meet these requirements. This would include a large number of situations, since theatrical film exhibition actually represents a relatively small portion of total film use.

Physiological measures would present serious problems in a theatrical setting due to hardware limitations. In the past, it has been possible to record data from only a few subjects simultaneously. This technological barrier may be overcome in the near future as wireless telemetry hardware becomes more readily available. In any case, the taking of numerous physiological records at the same time compounds the difficulty of monitoring base levels and would necessitate several trained researchers working in concert.

SUMMARY

This study used films of bland and aggressive content to investigate arousal effects on viewers as a function of viewing media. Two different types of aggressive films were included to ascertain the effects of variable content. A repeated measures design was employed, featuring complete between-cell comparisons and subjects as self-controls. Dependent measures were taken on physiological and psychological dimensions, with the analysis performed on both using the Lindquist Type IV analysis of variance model for mixed designs. The SCR constituted the measuring technique for autonomic response and the Nowlis Mood Adjective Check List was used for self-evaluation of mood.

Four principal conclusions sum up the findings: 1) No substantial support was found to indicate a general media effect on viewer arousal, 2) Different types of aggressive film content create different arousal levels, 3) Acts of film violence showing violent death create greater SCR arousal levels in film viewers than in television viewers, and 4) Uninteresting film content produces

sub-resting SCR levels.

Three other conclusions are also suggested: 1) Isolated media effects and a consistent pattern of SCR means may indicate a possible media effect of significant proportions in the case of theatrical film exhibition, 2) A bland (non-aggressive) film can create greater arousal than an aggressive film, and 3) The apparent reliability displayed by the SCR and MACL measures encourage their use in experimental film study.

TABLE 1
Overall Design of Films and Treatments

Group	Session 1		Session 2	
	FILM		TV	
1	B ₁	A ₁	B ₂	A ₂
2	B ₂	A ₂	B ₁	A ₁
	TV		FILM	
3	B ₁	A ₁	B ₂	A ₂
4	B ₂	A ₂	B ₁	A ₁

TABLE 2

ANOVA Summary Table for SCR Data

Source of Variance	df	MS	F	p
TOTAL	63	248.63		
BETWEEN SUBJECTS	15	224.78		
Media (C) ¹	1	470.03	2.03	n.s.
Version (D) ²	1	1.62	.01	n.s.
C X D	1	121.92	.53	n.s.
Error (b)	12	231.51		
WITHIN SUBJECTS				
Session (A) ³	1	503.53	2.29	n.s.
A X C	1	117.66	.53	n.s.
A X D	1	3354.94	15.10	< .005
Error (1)	12	222.24		
Emotion (B) ⁴	1	1282.38	11.51	< .01
B X C	1	29.00	.26	n.s.
B X D	1	.01	.00	n.s.
B X C X D	1	494.03	4.43	< .10
Error (2)	12	111.44		
A X B	1	3.05	.03	n.s.
A X B X C	1	257.92	2.38	n.s.
A X B X D	1	373.59	3.45	< .10
A X B X C X D	1	76.33	.71	n.s.
Error (3)	12	108.25		

¹ Film vs. television

² B₁A₁ vs. B₂A₂

³ Session 1 vs. session 2

⁴ Bland vs. aggressive films

TABLE 3

Log SCR Means, Session By Version

Version	Session 1	Session 2
1 - 2 ¹	-6.01	14.11
2 - 1 ²	8.15	-.69

¹B₁A₁ in Session 1 and B₂A₂ in Session 2

²B₂A₂ in Session 1 and B₁A₁ in Session 2

TABLE 4

Log SCR Means from Individual Cells

Group	<u>n</u>	FILM		TV	
		Bland	Aggressive	Bland	Aggressive
1	4	-9.89 (B_1)	-7.72 (A_1)	15.92 (B_2)	23.21 (A_2)
2	4	-.01 (B_2)	27.32 (A_2)	-.21 (B_1)	4.18 (A_1)
3	4	-1.04 (B_2)	18.34 (A_2)	-6.68 (B_1)	.25 (A_1)
4	4	-4.86 (B_1)	-1.87 (A_1)	2.08 (B_2)	3.21 (A_2)

TABLE 5

Log SCR Version Means from Combined Sessions

Version	Film	Television	$\bar{X}^1$
B ₁	-7.37	-3.44	-5.41
A ₁	-4.69	2.21	-1.29
B ₂	-.52	9.00	4.24
A ₂	22.83	13.21	18.02

¹Grand mean is a mean of the means.

TABLE 6

Emotion by Version Log SCR Means from
Television Groups

Version	Bland	Aggressive
1 - 2	-3.86	9.30
2 - 1	-1.39	.67

Table 7
Factor Matrix for Nowlis MACL Post and Combined Scores

MOOD VARIABLE	FACTOR 1		FACTOR 2		FACTOR 3		FACTOR 4		FACTOR 5		FACTOR 6	
	p ^a	c ^b	p ^a	c ^b	p ^a	c ^b	p ^a	c ^b	p ^a	c ^b	p ^a	c ^b
AGGRESSION												
Annoyed	-.07	.25	.42	-.25	.00	.10	-.02	.30	.04	.59	.09	.29
Fed-Up	-.01	.20	.38	.00	-.17	-.01	.07	.18	.02	.71	.01	.14
Rebellious	.08	.57	-.07	.04	-.10	-.41	.14	.00	.23	.23	-.14	.24
Angry	-.10	.61	.06	-.40	-.05	-.10	.40	.14	.01	.54	-.02	.31
Defiant	.22	.75	-.03	.36	-.12	-.36	.09	.02	.17	.08	-.24	.12
Grouchy	-.06	.30	.06	-.26	.00	.23	.31	.24	-.14	.32	-.01	.14
SOCIAL AFFECTION												
Sociable	.25	-.24	-.02	.64	.02	-.41	.03	-.14	-.05	.05	.36	-.26
Warmhearted	.36	.21	-.07	.70	-.10	-.09	.03	.11	-.02	-.23	-.10	-.24
Kindly	.34	-.02	-.05	.72	.08	-.07	-.09	.15	-.08	-.19	.08	-.24
Genial	.22	-.13	-.15	.50	-.05	-.06	.12	.00	-.17	-.08	-.03	-.28
Forgiving	.32	-.04	.00	.59	.13	-.07	-.22	.40	.07	-.23	-.13	.03
Affectionate	.34	.25	.14	.70	.02	-.28	.02	.52	.00	.15	.07	-.07
ACTIVATION												
Energetic	-.06	.08	-.03	.03	-.31	-.79	.16	-.14	.10	-.02	.27	.03
Vigorous	.09	.33	-.05	.21	-.33	-.70	.10	.07	.18	-.13	-.08	.16
Active	.02	-.03	.06	.15	-.07	-.78	-.11	-.06	.38	.03	.15	.32
DEPRESSION												
Regretful	.00	.34	-.07	-.21	.15	.20	.45	.48	-.07	.37	-.02	.05
Downhearted	.04	.45	.28	.02	-.03	-.02	.24	.57	.00	.59	.09	.07
Insecure	.05	.13	.21	.11	.23	.01	.19	.23	-.11	.32	.11	-.01
Sad	.07	.58	-.09	-.19	.00	-.07	.33	.20	.16	.31	-.05	.41
Frustrated	.03	.68	.16	-.16	.00	-.09	.17	.29	-.01	.38	-.37	.37
Sorry	.07	.40	.35	.09	.03	-.02	-.06	.26	.09	.24	-.13	.37
Blue	.05	.26	-.04	-.06	.41	.13	.19	.79	.04	.20	-.09	.16
Lonely	.17	-.08	.17	.19	.20	.00	-.01	.76	-.14	.18	-.11	.03
ANXIETY												
Jittery	.06	.41	.12	-.01	.09	-.34	.01	.02	.30	.45	-.09	.36
Shocked	-.08	.31	.05	-.28	.04	-.44	.09	.02	.35	.29	.09	.75
Fearful	.00	.13	-.03	-.18	.44	-.05	-.02	.13	.23	.18	.05	.65
Clutched-Up	.09	.52	.09	.18	.00	-.10	.03	.15	.12	.18	-.34	.21
Startled	-.03	.30	-.02	-.12	.14	-.29	-.09	-.09	.40	.06	-.07	.85
PLEASANTNESS												
Pleased	.05	-.12	-.38	.25	.03	-.21	.11	-.03	.04	-.39	.13	-.18
Lighthearted	.33	.13	-.03	.74	.00	-.23	-.03	-.03	.09	.02	.12	-.10
Carefree	.17	-.14	.10	.41	-.17	-.12	.14	.29	-.19	.03	.05	-.33
Playful	.31	.18	-.04	.66	-.07	-.38	-.01	.12	.00	-.09	.06	-.23
Talkative	.05	.18	-.20	.15	-.07	-.50	.20	.12	.23	.07	.02	.24
Witty	.16	-.06	.21	.48	.07	-.35	.03	.15	.03	.29	.35	.14
Lively	-.04	.09	.08	.13	-.03	-.68	.03	-.27	.21	.08	.36	.11
Refreshed	.06	.05	.10	.30	-.36	-.41	-.14	-.02	.04	-.20	-.12	-.02

^aPost scores, orthogonal rotation with varimax solution

^bCombined scores, oblique rotation

FOOTNOTES

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